# Are You in Line with the Future of Lighting?

## Keep in Step by using High-Performance Ballasts.

ELT ERC HELVAR MAYR CHRISTE TRIDONIC VS VOSSLOH SCHWABE

# New European Guidelines

The European Standard EN 50294 fixes the measuring methods for the total input power of the ballast-lamp system. Using this European Standard as a basis, CELMA (the European Federation of the National Associations of the manufacturers of luminaires, control gears and lampholders) has fixed both energy classes and limit values for the ballast-lamp combination of the most common fluorescent lamps.

**Energy Index System (EEI)**
The "Energy Efficiency Index System" (EEI) contains 7 classes: A1, A2, A3, B1, B2, C and D. The guideline is valid for mains-operated ballasts for fluorescent lamps.

The EEI comprises the following lamp types:
· Tubular fluorescent lamps T8
· Compact fluorescent lamps TC-L
· Compact fluorescent lamps TC-D
· Compact fluorescent lamps TC-T
· Compact fluorescent lamps TC-DD

**The 7 EEI classes using a 36 WT8 (T26) lamp as an example**

| Class | Description | System power in Watt |
|---|---|---|
| D = | Magnetic Ballasts with high losses | > 45 W |
| C = | Standard Magnetic Ballasts | ≤ 45 W |
| B2 = | High-Performance Magnetic Ballasts | ≤ 43 W |
| B1 = | High-Performance Magnetic Ballasts | ≤ 41 W |
| A3 = | Electronic Ballasts | ≤ 38 W |
| A2 = | Electronic Ballasts | ≤ 36 W |
| A1 = | Dimmable Electronic Ballasts | ≤ 38/19 W (at 100%/25%) |

**Phase-Out Dates according to European Directive No. 2000/55/EC**

| | | |
|---|---|---|
| Step I | Class D | To be discontinued on 21.05.2002 |
| Step II | Class C | To be discontinued on 21.11.2005 |
| Step III | Class B2 | No phase-out intended |
| | Class B1 | No phase-out intended |
| | Classes A1, A2 and A3 | No phase-out intended |

The wide range of high-performance magnetic ballasts offered by leading European ballast manufacturers enables immediate upgrading from standard products to high-performance versions, e.g. class B2.

In addition to these future-orientated magnetic products, these companies also offer complete ranges of high-performance electronic ballasts featuring additional advantages like flicker-free light, increased lamp life, etc.

Yet the market also offers low-performance, solely purchase-cost-orientated electronic ballasts which, owing to their various application restrictions, are no alternative for high-performance magnetic or electronic ballasts.

# Product Characteristics

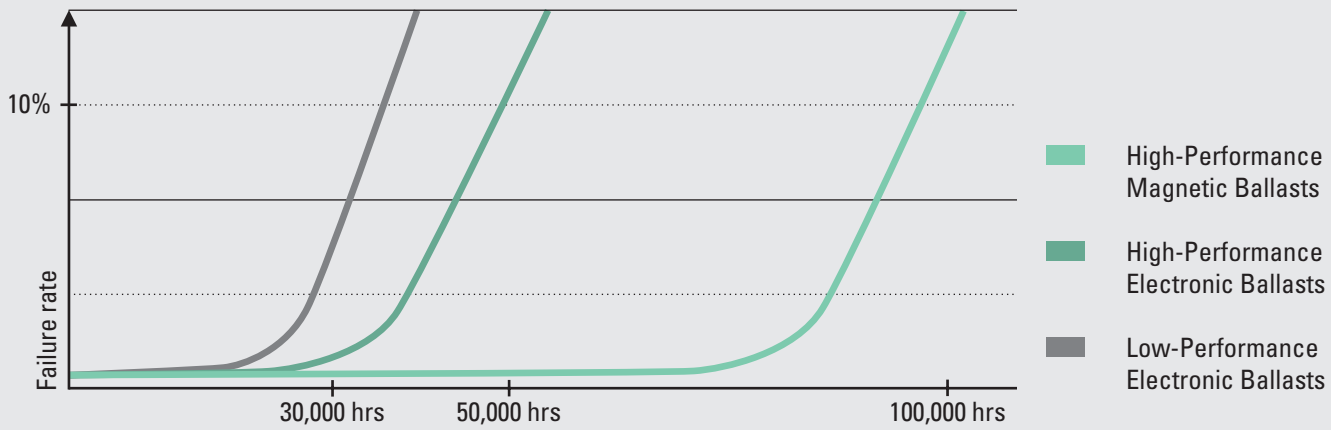
## Product Advantages At A Glance

| | High-Performance Magnetic Ballasts | High-Performance Electronic Ballasts | Low-Performance Electronic Ballasts |
|---|---|---|---|
| Ballast lifetime | Excellent | Good | Poor |
| Failure rate | Excellent | Good | Poor |
| Lamp lifetime, switchings/day | Good | Excellent | Poor |
| Energy saving | Good | Excellent | Good |
| Recycling | Excellent | Good | Poor |
| Protection class variability | Excellent | Excellent | Poor |
| Radio disturbance | Low | Low | High |
| Restrike after lamp change | Yes | Yes | No |
| Operating temperature range | Very wide | Wide | Restricted |
| Constant light output | No | Yes | No |
| Flicker free light | No | Yes | Yes |
| Purchase costs | Very Low | Moderate | Low |
| Total costs | Very low | Low | High |

## Technical Product Features

| | High-Performance Magnetic Ballasts | High-Performance Electronic Ballasts | Low-Performance Electronic Ballasts |
|---|---|---|---|
| Ballast lifetime (hours) | 100,000 hrs | 50,000 hrs | 30,000 hrs |
| Failure rate | 1% per 10,000 hrs | 2% per 10,000 hrs | 4% per 10,000 hrs |
| Failure rate during warranty time (8,000 operating hours) | 0.1% | 1.6% | 3.2% |
| Lamp life* | Nominal | Increased | Increased |
| Lamp switchings per day | 1-10 | 1-40 | 1-2 |
| Restrike after lamp change | Automatically | Automatically | Only after mains interruption |
| Radio disturbance | Suppressed up to 1 GHz (EN 55022) | Suppressed up to 1 GHz (EN 55022) | Suppressed up to 30 MHz (EN 55015) |
| Constant light output | depending on the supply voltage | irrespective of the supply voltage | in line with the supply voltage |

* Lamp life, depending on switching cycles



# Cost Characteristics

**Cost Factors using a twin-lamp luminaire as an example**

| | High-Performance Magnetic Ballasts | High-Performance Electronic Ballasts | Low-Performance Electronic Ballasts |
|---|---|---|---|
| Purchase Costs | 40% - 60% | 100% | 60% - 80% |
| Service costs during 50,000 hrs (IEC value) | euro 0.00 (no failure) | euro 0.80 and more<br>0.1 ballast replacement | euro 8.00 and more<br>1 ballast replacement |
| Disposal costs | euro 0.00 | euro 0.30 | euro 3.00 |
| Cost summary | Ballast costs + euro 0.00 | 1.1 ballast costs + euro 1.10 | 2 ballast costs + euro 11.00 |
| Hidden costs | 0.00 | see below | see below |
| Total Costs | Very low | Low | High |

### Replacement Costs

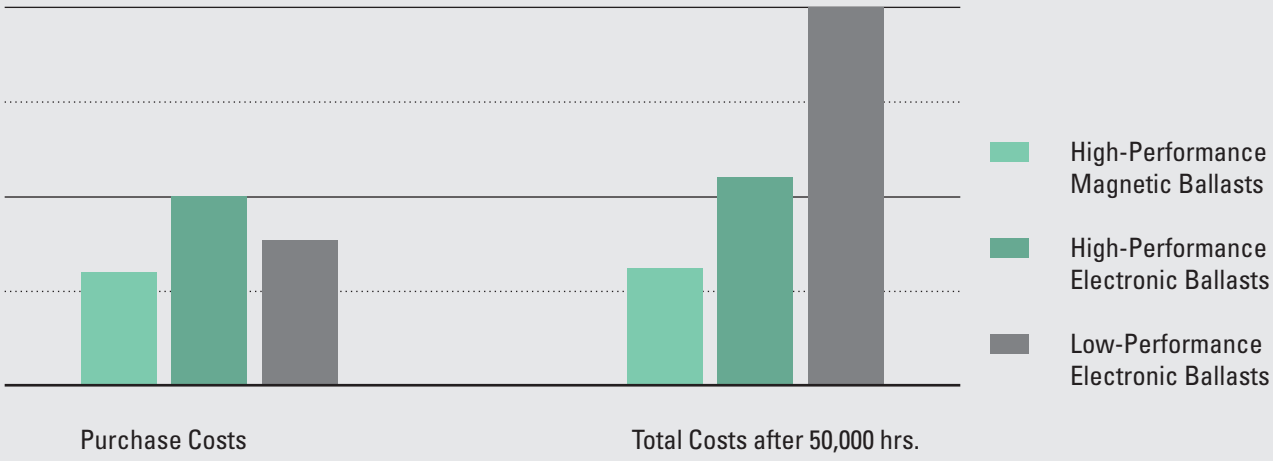
Ballast replacement costs total approx. euro 8.00 on average. While an operation time of 50,000 hrs will mean 100% of low-performance ballasts have to be replaced, this figure is zero for high-performance magnetic ballasts and only 10% for high-performance electronic ballasts. Furthermore, the logistics involved will lead to much higher purchase costs for replaced ballasts.

### Disposal Costs

A conservative calculation puts disposal costs in the region of euro 3.00 per ballast. As a directive to control the disposal of electronic waste in the future is already under consideration, the disposal issue constitutes an important cost analysis factor.

### Hidden Costs

These are all costs for services and overheads that arise in responding to the increased failure rate of low-performance luminaires during the warranty period.




The low-performance electronic ballasts currently available on the market are solely low-price-orientated and constitute a technological step backward. Users of such products are confronted with numerous disadvantages with regard to technical features and major restrictions in respect of operating conditions.

However, next to taking the basic purchase costs into account, consumers are - now and in future - strongly recommended to focus on the cost-effectiveness of the entire lighting system. If one looks at the total replacement and disposal costs the economic superiority of high-performance magnetic and electronic ballasts becomes clearly evident.

A further and yet to be mentioned factor are the marketing costs that arise in preventing a loss of company image as a result of a high luminaire failure rate.

# Future-Orientated Components

Today and in future, choosing the right ballast is of vital importance for the quality of lighting systems. The high-performance versions of magnetic and electronic ballasts offer the decisive system advantages needed to optimise lighting systems.

**System advantages of high-performance magnetic ballasts**
· extremely long lifetime
· zero failure rate during the entire period of use
· trouble-free exterior lighting applications, even in sub-zero temperatures
· recyclable materials
· low purchase costs
· automatic restrike after lamp change

**System advantages of high-performance electronic ballasts**
· high lifetime > 50,000 hrs
· high power factor
· stable output
· gentle warm start, high-frequency switching possible
· energy saving > 25%
· only high-performance electronic ballasts are suitable for the new T5 lighting generation
· cut-off in case of failure
· automatic restrike after lamp change
· dimmable

**System advantages of low-performance electronic ballasts**
· low purchase costs
· energy saving

**Material Recycling and Disposal**
High-performance magnetic ballasts are fully recyclable. The materials used can be separated, reused and processed. As diverse materials found in electronic ballasts are unfortunately environmentally incompatible, these materials must be treated as hazardous waste and disposed of accordingly. Given the low lifespan of low-performance electronic ballasts, this is both an environmental protection and an enormous cost factor.

**Which ballasts are right for the future?**
High-performance magnetic and high-performance electronic ballasts.

# Further information can be obtained from:


Especialidades Luminotécnicas S.A.
Polígono Industrial de Malpica, Calle E num. 11
E-50016 Zaragoza (España)
Tel.: +34 9 76 57 36 60
Fax: +34 9 76 57 49 60
www.elt.es

Elettro Radio Costruzioni S.P.A.
Via dei Sassi 2
I-28031 Caloziocorte (LC)
Tel.: +39 (0) 3 41/63 73 11
Fax: +39 (0) 3 41/63 73 00
www.erc.it

Helvar Oy Ab
Purotie 3
FIN-00380 Helsinki
Tel.: +3 58 (0) 95 65 41
Fax: +3 58 (0) 9 56 54 96 00
www.helvar.com

May & Christe GmbH
Hauptstrasse 204
D-63814 Mainaschaff
Tel.: +49 (0) 60 21/7 06-1 34
Fax: +49 (0) 60 21/7 06-1 71
www.maychriste.com

Tridonic Bauelemente GmbH
Färbergasse 15
A-6851 Dornbirn
Tel.: +43 (0) 55 72/3 95-0
Fax: +43 (0) 55 72/2 01 76
www.tridonic.com

Vossloh-Schwabe GmbH
Hohe Steinert 8
D-58509 Lüdenscheid
Tel.: +49 (0) 23 51/1 01-0
Fax. +49 (0) 23 51/1 01-217
www.vossloh-schwabe.com